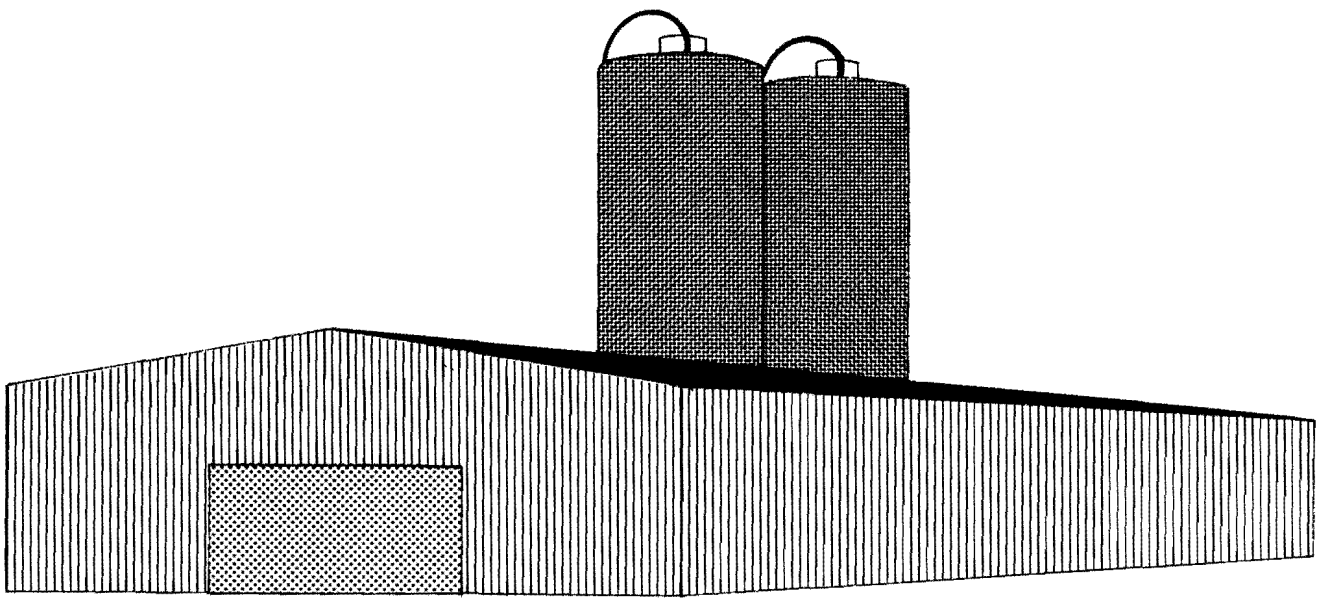
August 1971 A. E. Res. 331

DAIRY FARM MANAGEMENT

BUSINESS SUMMARY
NEW YORK
1970



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INTRODUCTION

In 1970, a group of more than 500 New York dairymen participated in College sponsored farm business management projects. These projects serve a dual purpose. They provide the basis for extension management programs and also data for applied research studies.

Farm business records were kept by each dairyman. Some used farm account books for keeping records while others participated in electronic farm accounting programs. In all cases, the information was submitted to the College for summary and analysis.

Extension agents cooperated in the organization of local groups and in collection of the data. Regional summary reports were prepared for use by the agents in their winter educational meetings with farmers. The aim of these extension activities was to help the dairy cooperators with their business management problems.

The records from all regions of the state were combined and used as the basis for a continuing study of factors affecting dairy farm incomes. The major purposes of this research are to: (1) keep abreast of changes taking place in dairy farming, and (2) provide current farm business data for use by dairymen, extension agents, teachers, agribusinessmen, policy makers, and others concerned with the New York dairy industry.

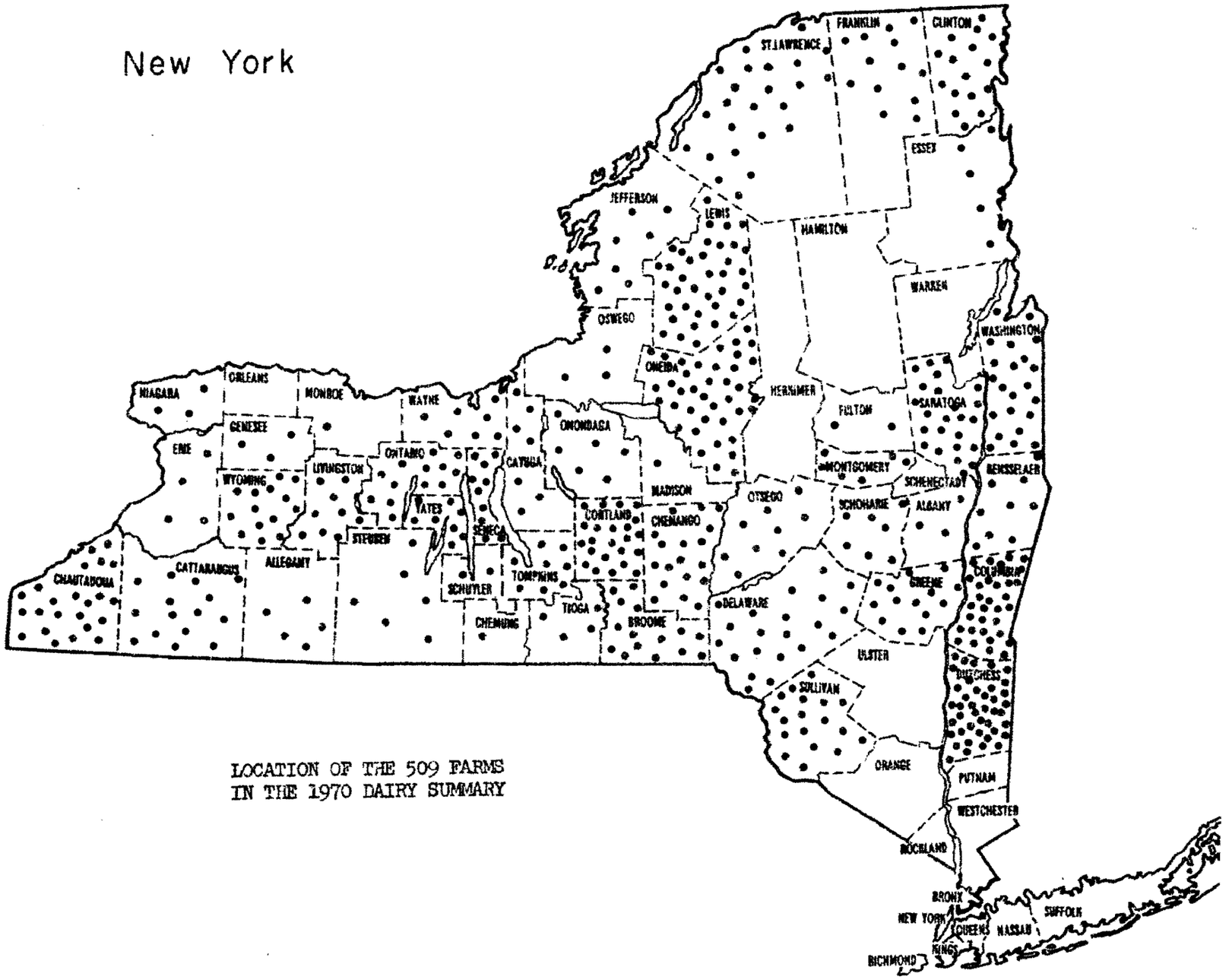
A total of 509 farm business records were included in the dairy summary for 1970. Farms with combinations of dairy and other major enterprises were excluded from the analysis reported in this publication. Two new features of the 1970 study are a summary of the financial situation on 159 farms, and an analysis of 117 farms with free stall housing facilities.

The results of this study do NOT represent the average of all dairy farms in the state. Participation in the project was on a voluntary basis. Although cooperators were located in various parts of the state not all areas were represented (see page 2). In general, the 509 farms represent a cross section of commercial operators who are above the average for all dairy farms in the state. For example, the median number of cows for the 509 farms was 55 while the state median was 38, and the milk sold per cow was 12,600 compared with the statewide median of 10,000 pounds.

Acknowledgements

C. A. Bratton, G. L. Casler, G. J. Conneman, C. H. Cuykendall, C. W. Loomis, A. C. Lowry, R. S. Smith, and S. F. Smith with the assistance of the Cooperative Extension Agents supervised the farm business management projects and the records which made this summary possible. Summarization and tabulation of the records and all machine operations were completed under the supervision of Myrtle Voorheis and the typing was done by Angie Torchia.

New York



LOCATION OF THE 509 FARMS
IN THE 1970 DAIRY SUMMARY

Growing Conditions

Table 1. TEMPERATURE, GROWING SEASON AND PRECIPITATION
Selected Stations

Station	Av. temperature May thru Sept.		Precipitation May thru Sept.		Precipitation Total annual		Length of growing season*	
	1941-70	1970	1941-70	1970	1947-67	1970	1947-70	1970
	Degrees		Inches				Days	
Alfred	61.8	63.2	17.3	16.5	36.7	35.4	125	151
Auburn	65.0	63.9	14.1	17.2	31.1	32.3	174	162
Batavia	64.0	66.1	15.3	20.5	31.8	40.6	154	163
Canton	63.0	62.6	16.5	17.5	34.9	34.5	127	141
Lowville	62.5	62.8	16.5	19.3	38.0	39.5	123	163
Norwich	61.9	61.7	18.4	19.1	40.1	38.0	120	162
Poughkeepsie FAA	66.3	67.7	16.7	15.2	38.2	34.4	164	163
Salem	62.8	63.9	18.4	20.8	39.0	36.5	119	130
Utica FAA	63.5	64.9	18.1	20.3	39.8	46.1	157	163

* Days between the last temperature of 32 degrees in the spring and the first in the fall

Weather is a factor to be considered when studying a farm business for a specific year. The growing conditions have a marked effect on the crops for the year. It is for this reason that data are presented on the growing conditions for 1970 and for the period 1941-70.

In general, the 1970 growing season can be characterized as having near normal temperatures, a slightly longer growing season and about normal annual rainfall. Conditions varied from area to area in the state. Data are presented for nine weather stations. The rainfall is reported by months for the growing season. May, June, and July were about normal in most areas while August and September were wet (table 2).

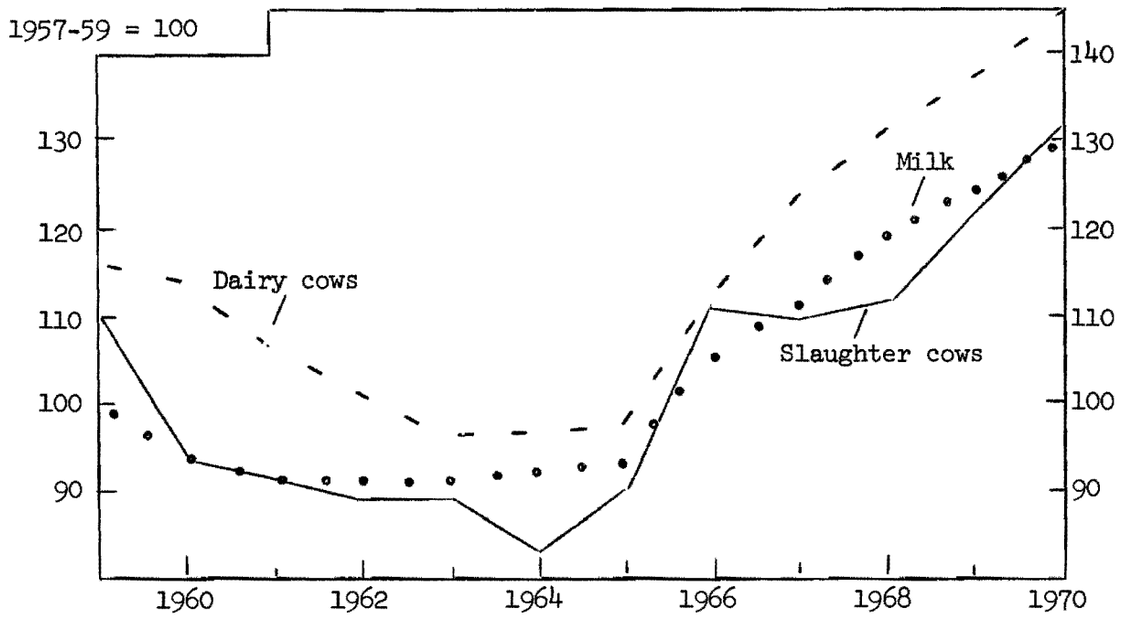
Table 2. GROWING SEASON RAINFALL
Selected Stations, 1941-70 and 1970

Station	May		June		July		August		September	
	1941-70	1970	1941-70	1970	1941-70	1970	1941-70	1970	1941-70	1970
Alfred	3.84	2.92	3.76	1.65	3.73	5.24	3.00	2.77	2.93	3.88
Auburn	2.82	2.86	2.90	3.25	3.43	4.04	2.57	3.62	2.35	3.38
Batavia	3.17	3.72	2.69	2.85	3.05	2.92	3.50	6.19	2.87	4.79
Canton	3.37	2.38	2.91	3.50	3.45	4.56	3.45	3.19	3.31	3.83
Lowville	3.42	3.21	2.94	4.36	3.26	3.84	3.58	3.24	3.31	4.63
Norwich	3.92	4.15	4.13	1.88	3.95	5.96	3.17	2.45	3.27	4.66
Poughkeepsie	3.37	2.96	3.42	2.96	3.20	1.89	3.59	4.03	3.16	3.31
Salem	3.75	3.62	3.89	4.35	3.66	4.19	3.43	2.87	3.67	5.79
Utica	3.52	3.87	3.55	5.79	4.17	1.56	3.54	3.54	3.32	5.51

SOURCE: Climatological Data, New York, Environmental Data Service, ESSA, U.S. Department of Commerce

Prices

PRICES RECEIVED BY N.Y. DAIRY FARMERS, 1959-1970



SOURCE: U.S.D.A. Agricultural Prices

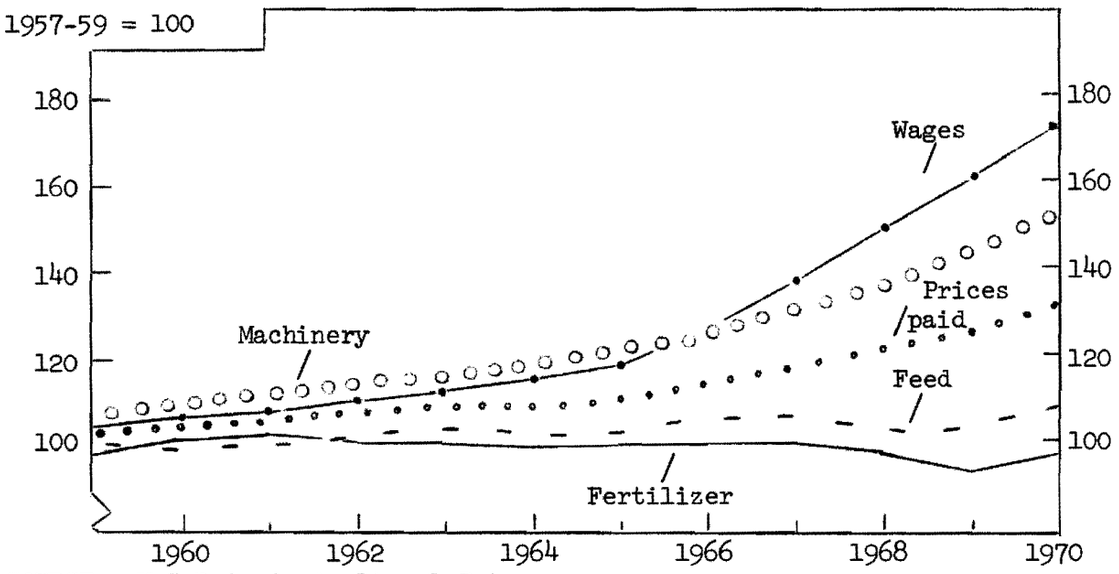
Prices are an important business factor. The relationship of prices received to prices paid determines the general level of incomes. A look at the 1970 price situation for the major items dairymen sell gives some perspective on the price climate for the year of this study.

Milk prices for 1970 averaged $5.89 compared with $5.66 in 1969 and $4.14 in 1962. Both dairy and slaughter cow prices in 1970 were at new highs for recent years. In general, prices received by dairymen in 1970 were good.

Table 3. PRICES RECEIVED FOR MILK AND COWS BY N.Y. FARMERS, 1959-1970

Year	Milk 3.5% B.F. (cwt.)	Slaughter cows (cwt.)	Dairy cows (head)	Monthly farm price per 100 pounds of milk, 1970	
1959	$4.58	$17.80	$284	January	$5.95
1960	4.31	15.00	278	February	5.95
1961	4.20	14.60	260	March	5.70
1962	4.14	14.26	245	April	5.65
1963	4.15	14.01	234	May	5.45
1964	4.21	13.17	237	June	5.35
1965	4.27	13.91	238	July	5.90
1966	4.79	17.35	271	August	6.20
1967	5.07	17.32	303	September	6.45
1968	5.43	17.72	320	October	6.65
1969	5.66	19.42	336	November	6.55
1970	5.89	20.71	353	December	6.35

PRICES PAID BY N.Y. DAIRY FARMERS, 1959-1970



SOURCE: U.S.D.A. Agricultural Prices

The index of prices paid by New York dairy farmers has risen steadily but items have changed by different amounts. Farm wages have increased the most. Fertilizer prices have declined some. Feed prices have fluctuated but in general have changed little. The overall index of prices paid by New York dairy farmers in 1970 was up 5 percent from 1969 and was 27 percent higher than 1960.

Table 4. PRICES PAID BY NEW YORK DAIRY FARMERS, 1959-1970

Year	Index 1957-59 = 100				Prices paid by New York dairy farmers	Dairy ration (cwt.)	Wages per month with house
	Feed	Fertilizer	Wages	Machinery			
1959	100	99	103	104	102	$3.55	$204
1960	99	100	106	107	104	3.55	210
1961	100	101	107	110	105	3.61	214
1962	102	100	110	112	106	3.68	218
1963	104	100	112	114	108	3.79	222
1964	101	99	115	116	108	3.72	228
1965	102	100	118	120	110	3.79	236
1966	106	100	126	124	113	4.00	254
1967	106	100	138	130	118	4.00	280
1968	103	98	150	136	121	3.70	302
1969	103	94	160	144	126	3.70	321
1970	109	98	174	152	132	3.90	354

Labor, Livestock, and Crops Grown

Any manager must operate within certain restrictions. One of these is the resources he has to use. For this reason the first thing we examine in the summary of the farm business is the labor, livestock, and land used for crops in the operation. Management has been described as "using what you've got to get what you want."

Table 5. LABOR FORCE, LIVESTOCK NUMBERS, AND ACRES OF CROPS GROWN
509 New York Dairy Farms, 1970

Item	My farm	Average of 509 farms		Range High	Range Low
Labor					
Months of:					
Operators	_____		14.1		
Family unpaid	_____		2.6		
Family paid	_____		1.9		
Hired	_____		7.3		
Other	_____		.3		
Total months	_____		26.2		
Man equivalent (no. men)	_____		2.2	8.0	1.0
Livestock (number)					
Cows	_____		65	314	18
Heifers	_____		43	215	0
Crops (acres grown)* - Data from 501 farms**					
Hay	_____	(491)	92	410	7
Hay crop silage	_____	(62)	27	150	2
Corn silage	_____	(468)	49	300	3
Corn for grain	_____	(189)	38	190	1
Oats	_____	(159)	23	100	3
Total acres of crops	_____	(501)	168	576	12

* Average for farms reporting so acres do not add to total. Number of farms growing is in parenthesis

** Eight farms omitted all crop information

Partnerships are relatively common on New York dairy farms. Eighty-six of the 509 farms had two or more operators with a total of 599 operators. Thus, about one-sixth of the farms were partnerships.

The average man equivalent was 2.2 with 8.0 the largest. Family members provided 18.6 months of labor compared with 7.6 months hired or 71 percent was family labor. These were family type farms.

Capital Investment

The end-of-year inventory is used as the measure of the capital investment. The inventory should reflect the "fair market value" or what things would bring at a well-attended sale. This is a general measure of the capital resource used in the business.

Table 6. FARM INVENTORY VALUES, JANUARY 1, 1971
509 New York Dairy Farms

Item	My farm	Average of 509 farms	% of total
Machinery & equipment	$_____	$ 29,067	21
Livestock	_____	32,187	23
Feed and supplies	_____	9,300	7
Land and buildings	_____	66,694	49
TOTAL INVESTMENT	$_____	$137,248	100

Total investment at the end of the year for the 509 farms averaged $137,000. The range was from $37,800 to $821,000. The investment in livestock was a little larger than that in machinery on these farms. The value of the personal property including feed and supplies on these dairy farms exceeded the value of the real property.

There was considerable variation in the total farm inventory value. There were 22 farms with investments of less than $50,000 but there were 39 with investments of $250,000 or more. Nineteen percent of the farms had investments of over $200,000. The distribution of total investment per farm is shown below.

Distribution of Farms by Total Investment

Total investment	Number of farms	Percent of farms
Under $50,000	22	4
$ 50,000 - 74,999	68	13
75,000 - 99,999	109	22
100,000 - 124,999	73	14
125,000 - 149,999	71	14
150,000 - 199,999	73	14
200,000 - 249,999	54	11
250,000 or more	39	8
TOTAL	509	100

Receipts

An examination of the receipts tells much about the nature of the business. The receipts are one indication of the accomplishments of the operation.

Table 7. FARM RECEIPTS
509 New York Dairy Farms, 1970

Item	My farm	Average of 509 farms	Percent of total
Milk sales	$_____	$50,154	88
Livestock sold	_____	5,134	9
Crop sales	_____	432	1
Government payments	_____	244	1
Gas tax refund	_____	101	--
Machine work	_____	92	--
Machinery sold	_____	114	--
Work off farm	_____	79	--
Miscellaneous	_____	711	1
Total Cash Receipts	$_____	$57,061	100
Increase in inventory	_____	9,406	
TOTAL FARM RECEIPTS	$_____	$66,467	
Average price per cwt. of milk sold	$_____	$6.10	

Milk sales on these 509 farms accounted for 88 percent of the total cash receipts. Livestock sold, the second largest item, accounted for an additional 9 percent. The cash flow into the business on these farms averaged $57,000. Increase in inventory, which is a non-cash receipt, averaged $9,400 or 14 percent of the total farm receipts. Composition of the increase is shown below. Land and buildings accounted for 41 percent of the increase in inventory. This reflects some of the changes in housing facilities.

Composition of Increase in Inventory

Inventory item	Average increase	Percent of total
Land & buildings	$3,867	41
Machinery & equipment	2,268	24
Livestock	2,228	24
Feed and supplies	1,043	11
TOTAL	$9,406	100

The average price per hundredweight of milk sold by the 509 farms in 1970 was $6.10. The average price is calculated by dividing the gross milk receipts for the year by the total pounds of milk sold. The variation in average price received is shown below:

Variation in Average Milk Price

Average price received for milk	Number of farms	Percent of farms
Below $5.50	7	1
$5.50 - 5.74	63	12
5.75 - 5.99	212	42
6.00 - 6.24	114	22
6.25 - 6.49	44	9
6.50 - 6.74	26	5
6.75 - 6.99	26	5
Over $7.00	17	4
TOTAL	509	100

Dairymen often say there is nothing they can do about the price received for milk. This may be true as it pertains to the price at a particular time, but the variation shown here does indicate that the average annual prices received for milk by farmers do vary. Management practices account for some of the differences. Seasonality of production and butterfat test are two management items that affect the average price for the year.

Gross receipts are sometimes used as a measure of size of business. The census of agriculture uses this measure in classifying farms. The distribution of total farm receipts of the 509 farms in 1970 is shown below:

Distribution of Farms by Total Farm Receipts

Total farm receipts	Farms	
	Number	Percent
Under $20,000	8	2
$ 20,000 - 29,999	44	9
30,000 - 39,999	72	14
40,000 - 49,999	96	19
50,000 - 59,999	69	13
60,000 - 79,999	79	16
80,000 - 99,999	56	11
100,000 - 119,999	37	7
120,000 and over	48	9
TOTAL	509	100

More than one-half of the 509 farms had receipts of over $50,000 and 16 percent had receipts of $100,000 or more.

Expenses

Dairymen today buy many inputs for their operations. In addition to knowing the total expenses, it is helpful to have a breakdown by specific items.

Table 8. FARM EXPENSES
509 New York Dairy Farms, 1970

Item	My farm	Average of 509 farms	Percent of total
Hired labor	$_____	$ 4,388	13
Dairy concentrate	_____	12,463	37
Other feed	_____	354	1
Machine hire	_____	290	1
Machinery repairs	_____	2,272	7
Auto expense (farm share)	_____	243	1
Gas and oil	_____	1,381	4
Breeding fees	_____	583	2
Veterinary and medicine	_____	832	2
Milk hauling	_____	545	1
Other livestock expense	_____	1,890	6
Lime and fertilizer	_____	2,117	6
Seeds and plants	_____	569	2
Spray, other crop expense	_____	561	1
Land, building, fence repair	_____	1,092	3
Taxes	_____	1,438	4
Insurance	_____	868	3
Electricity (farm share)	_____	769	2
Telephone (farm share)	_____	181	--
Miscellaneous	_____	1,206	4
Total Cash Operating Expenses	$_____	$34,042	100
New machinery*	_____	6,480	
Real estate**	_____	4,244	
Livestock purchases**	_____	2,254	
Unpaid labor	_____	775	
Decrease in inventory	_____	--	
TOTAL FARM EXPENSES	$_____	$47,795	

* Depreciation $4,098 -- see page 24 for calculations

** Number reporting purchase of real estate, 261; livestock, 321

The expense classification used on page 10 is taken from the "Cornell Farm Account Book." Lists of the items included in each category are presented on the inside back cover of that account book.

Unpaid family labor refers to work done by members of the family who are not paid cash wages. The operator estimates the number of months of unpaid labor. This is charged to the business at $300 per month.

Decrease in inventory is the amount that the beginning inventory exceeds the end inventory. Since this indicates a "using up" of capital items, it is considered as a farm expense. Some individual farms had a decrease, but the net inventory change for the 509 farms was an increase.

Total farm expenses for the 509 farms averaged $47,795 or $131 per day. The cash operating expenses averaged $34,000 or 71 percent of the total. Expenditures for capital items like machinery, buildings, and livestock are often paid for by loans rather than cash. It is for this reason that they are separated in this classification.

The cash operating expenses averaged $524 per cow. When capital items and unpaid labor were included, the total farm expenses averaged $735 per cow.

Farm expenses can be classified in various ways. Another way to study expenses is to divide them on the basis of fixed, variable, and capital items. This is shown below:

Capital expenses (investments)	
Machinery	$ 6,480
Real estate	4,244
Livestock	2,254
Total Capital	$12,978

Overhead expenses (fixed)	
Property taxes	$ 1,438
Insurance	868
Land & building repairs	1,092
Electricity	769
Telephone	181
Total Fixed Overhead	$ 4,348

Operating expenses (variable)	
Labor	$ 5,163
Feed	12,817
Machinery repairs	2,272
Gas & oil	1,381
Machine hire	290
Auto	243
Livestock expenses	3,850
Fertilizer & lime	2,117
Other crop expenses	1,130
Miscellaneous	1,206
Total Variable	$30,469

The variable expenses on these farms accounted for 64 percent of the grand total. These are items over which the operator has direct control. The fixed items accounted for only 9 percent of the total, and capital items 27 percent. The variable expenses are the ones the dairymen must make decisions on daily.

Income

Researchers have developed a number of ways to measure the income from a farm business. The measure to be used depends on the point from which the results are being studied. Several common measures are reported here. The user can select the measure that best fits his situation.

Table 9. FARM INCOME AND LABOR INCOME
509 New York Dairy Farms, 1970

Item	My farm	Average of 509 farms	Percent of receipts
Total farm receipts	$_____	$66,467	100
Total farm expenses	_____	47,795	72
FARM INCOME	$_____	$18,672	28
Interest on av. capital @ 7%	_____	9,278	14
Labor income per farm	$_____	$ 9,394	14
Number of operators	_____	599	
LABOR INCOME PER OPERATOR	$_____	$ 7,983	

Farm income measures the return from the business to all capital and the operator's labor and management. Farm income is the difference between total receipts, including increase in inventory, and total expenses, including decrease in inventory but excluding interest payments.

Labor income is the return to the farm operator for his labor and management. This is the measure most commonly used when studying or comparing farm businesses. To get the labor income, a 7 percent interest charge on all capital is subtracted from the farm income. Prior to 1969, a 5 percent interest charge was made. In making income comparisons with 1968 and earlier, the difference in interest rate charged must be kept in mind.

Distribution of Labor Incomes Per Operator

Labor income per operator	Farms	
	Number	Percent
Minus	46	9
$ 0 - 4,999	126	24
5,000 - 9,999	171	34
10,000 - 14,999	97	19
15,000 - 19,999	35	7
20,000 - 24,999	18	4
25,000 or more	16	3

Table 10. FARM CASH OPERATING INCOME AND DEBT PAYMENT ABILITY
509 New York Dairy Farms, 1970

Item	My farm	Average of 509 farms
Total cash receipts	$_____	$57,061
Total cash operating expense	_____	34,042
FARM CASH OPERATING INCOME	$_____	$23,019
Family cash living expenses*	_____	6,355
DEBT PAYMENT ABILITY	$_____	$16,664

* Estimated at $5,400 per operator per year

Farm cash operating income reflects the cash available from the year's operation of the farm business for family living, interest and debt payments, and new capital purchases or investments. A family may have had additional cash available if some member of the family had a nonfarm income, or if money were inherited or borrowed.

Debt payment ability is a measure of the amount of cash available for debt payments. It is calculated by deducting family living expenses from the farm cash operating income. It is assumed here that new machinery, real estate, and livestock are purchased with borrowed capital. This measure is useful in planning debt payment schedules.

Rate of return on investment is calculated by deducting a charge for the operator's labor from the "farm income." This is then divided by the average investment for the year to determine the rate of return on investment. In the above calculation, $5,400 has been used arbitrarily as the value of the operator's labor. This is comparable to what "good" hired men earn. Rate of return really reflects the return to capital and management.

Table 11. RATE OF RETURN ON INVESTMENT
509 New York Dairy Farms, 1970

Item	My farm	Average of 509 farms
Farm income	$_____	$18,672
Value of operator's labor*	_____	6,355
Return on investment	$_____	$12,317
Average capital investment	$_____	$132,545
RATE OF RETURN ON INVESTMENT	_____%	9.3%

* $5,400 per operator - some farms had more than one operator

Farm income as calculated here is the return from the business for three major input items: (1) the operator's labor input, (2) the operator's management input, and (3) the total capital input.

In calculating operator's labor income, the first two inputs are combined and in calculating rate of return on investment, the last two are combined.

In nonfarm businesses, another measure is sometimes used, namely, "profit." This can be done where the management inputs are actually hired. In some farm management studies, the management input has been valued at 8 percent of the cash farm receipts, and the operator's labor at the average wage for hired men with houses. Using this method, the farm income can be separated as follows:

Farm Income $18,672		
	Operator's labor @ $80/week	$4,900
	Management @ 8% of cash receipts	$4,565
	Interest on capital @ 7%	$9,278
	Profit	$-71

Income from a business can also be calculated in relation to various input units. For example, since these are family-type farms, the labor and management return can be figured on a per-man basis. This is shown below:

Return to All Labor

Labor income per farm	$ 9,394
Value hired labor	4,388
Value unpaid labor	775
Total returns to labor	$14,557
Average man equivalent	2.2
Returns per man equivalent	$6,617
Returns per hour (3,000 hrs./yr.)	$2.21

In like manner, returns can be calculated on the basis of production units or on a per-cow basis. These are given below:

Returns per Cow

Cash operating income per cow	$354
Farm income per cow	$287
Labor income per cow	$145

ANALYSIS OF THE FARM BUSINESS

This part of the report includes a systematic analysis of the farm business to determine strengths and weaknesses. Five business factors are examined. These are: size of business, rates of production, labor efficiency, use of capital, and cost control. The 1970 averages for selected measures for each of these factors are reported along with general relationships of each to labor income.

The measures examined here are interrelated. This means that all factors should be examined before arriving at major conclusions.

Size of Business

Size of farm has an effect on other factors such as labor efficiency, cost control, and capital efficiency. The prices received and paid by a farmer are often affected by the volume which is a function of size. Farm management studies have shown that in general larger farm businesses make larger labor incomes. Two basic reasons for this are that larger businesses make possible more efficient use of overhead inputs such as labor and machinery, and there are more units of production (milk) on which to make a profit.

Table 12. MEASURES OF SIZE OF BUSINESS
509 New York Dairy Farms, 1970

Measure	My farm	Average of 509 farms
Number of cows	_____	65
Total acres in crops	_____	168
Man equivalent	_____	2.2
Total work units	_____	691
Pounds of milk sold	_____	822,200
Total cash receipts	$_____	$57,061
Total investment	$_____	$137,248

Number of cows is the average number in the herd for the year. Where available, the D.H.I.C. annual average is used.

Total acres in crops includes all acres on which crops were harvested during the 1970 year. It does not include cropland pasture or uncropped land.

Man equivalent is the amount of labor available on the farm during the year in terms of full-time man years. Work by part-time workers and family members is converted to full-time man equivalent.

Total work units represents the number of productive man days that would be required, under average conditions, to care for the acreage of crops grown and the number of livestock handled. A man work unit is the average amount of productive work accomplished in ten hours.

Table 13. COWS PER FARM AND LABOR INCOME
509 New York Dairy Farms, 1970

Number of cows	Number of farms	Percent of farms	Labor income per operator
Less than 25	5	1	$ 3,280
25 - 39	93	18	4,560
40 - 54	150	30	6,780
55 - 69	91	18	7,400
70 - 84	63	12	8,410
85 - 99	32	6	13,200
100 - 114	29	6	12,750
115 - 129	19	4	16,950
130 and over	27	5	12,900

The relationship of size of business and labor income was observed for size as measured by number of cows and by man equivalent. The pattern was the same for both measures, the larger the business the higher the labor income per operator up to 100 cows and to a 3.5 man equivalent after which the incomes varied. The number of farms in the larger groups were relatively small so cannot be used as conclusive evidence.

The 1970 relationship is consistent with that of earlier studies. A well-managed large farm will provide the operator a higher income than a well-managed small one. However, a large farm poorly managed can lose more than a poorly managed small farm.

Man equivalent is often used as a measure of size. It is of interest that 81 percent of the farms had man equivalents of less than 3.0 (table 14). Forty-four percent of the farms had less than 2.0 men.

Table 14. MAN EQUIVALENT PER FARM AND LABOR INCOME
509 New York Dairy Farms, 1970

Man equivalent	Number of farms	Percent of farms	Number of cows	Labor income per operator
1.0 - 1.4	121	24	40	$ 6,660
1.5 - 1.9	100	20	48	7,440
2.0 - 2.4	138	27	60	7,330
2.5 - 2.9	53	10	82	9,480
3.0 - 3.4	51	10	97	11,170
3.5 - 3.9	17	3	103	10,110
4.0 and over	29	6	138	10,930

Rates of Production

Production per animal and per acre are factors that affect farm incomes. High rates of production, however, must be obtained at reasonable costs. Production techniques must be considered from an economic point of view.

Table 15. MEASURES OF RATES OF PRODUCTION
509 New York Dairy Farms, 1970

Measure	My farm	Average of 509 farms
Pounds of milk sold per cow	_____	12,600
Tons hay per acre	_____	2.7
Tons corn silage per acre	_____	15
Bushels of oats per acre	_____	68
Bushels grain corn per acre	_____	72
Bushels of wheat per acre	_____	38

Pounds of milk sold per cow is calculated by dividing the total pounds of milk sold by the average number of cows. The average for the 509 farms was 12,600 pounds per cow with a range from 5,300 pounds to 18,100 pounds. Because some milk is used in the home and fed to calves, D.H.I.C. production levels will usually be somewhat higher than actual pounds of milk sold.

Studies have shown repeatedly that farms with higher rates of production tend to have higher labor incomes. In 1970, the farms with the higher rates of production were larger and bought more feed per cow, and in general it paid off as shown by the higher incomes. There were some variations like the 12,000 - 12,999 group which are probably reflections of the effects of other factors.

Table 16. MILK SOLD PER COW AND LABOR INCOME
509 New York Dairy Farms, 1970

Pounds of milk sold per cow	Number of farms	Number of cows	Feed bought per cow	Labor income
Under 10,000	52	53	$155	$ 1,940
10,000 - 10,999	51	60	156	4,720
11,000 - 11,999	68	64	186	7,510
12,000 - 12,999	98	68	196	6,560
13,000 - 13,999	107	75	190	11,540
14,000 - 14,999	69	63	207	9,620
15,000 and over	64	60	235	11,460

Labor Efficiency

Accomplishments per worker are used to measure labor efficiency. With wage rates rising more than any other cost item, it is important to keep output in line with wage rates. Labor efficiency is a major factor in any farm business analysis.

Table 17. MEASURES OF LABOR EFFICIENCY
509 New York Dairy Farms, 1970

Measure	My farm	Average of 509 farms
Pounds of milk sold per man	_____	373,700
Number of cows per man	_____	30
Work units per man	_____	314
Crop acres per man	_____	76

Pounds of milk sold per man is determined by dividing the total pounds of milk sold by the man equivalent. This is probably the best measure of labor efficiency for dairy farms. This averaged 373,700 pounds per man on the 509 farms but ranged from a low of 53,000 pounds to a high of 828,000.

abor accomplishments (efficiency) depends on a number of things. Among these are the amount of mechanization, the field and building layout, the work methods used, and the abilities of the workers. All of these are management items under the control of the operator.

The relationship of labor efficiency to labor income was very definite on the 509 farms. The higher the pounds of milk sold per man, the higher the income. The higher output per man was accomplished in part at least by more and higher producing cows (table 18). It is interesting to observe that 67 or more than one farm in eight, sold half a million pounds or more of milk per man.

Table 18. MILK SOLD PER MAN AND LABOR INCOME
509 New York Dairy Farms, 1970

Pounds of milk sold per man	Number of farms	Number of cows	Lbs. milk per cow	Labor income per operator
Under 200,000	22	31	9,500	$ 520
200,000 - 299,999	104	51	11,600	4,120
300,000 - 399,999	197	61	12,500	6,840
400,000 - 499,999	119	74	13,400	10,640
500,000 and over	67	92	13,800	15,980

Use of Capital

The capital investment on the dairy farms included in these summaries has more than doubled in the last decade. The average end-of-year inventory on the 509 farms was over $130,000. This includes both owned and borrowed capital. The use of credit is part of capital management. Since capital is a key input item, it is important to analyze the use of capital in the business.

Capital is a cost to the business and like other costs it can get out of line. Capital costs are affected by size of total investment and rates paid for borrowed money. With today's relatively high interest rates, it is more important than formerly to use capital efficiently.

The analysis in this section examines how the capital is used and the financial situation of the farm family.

Table 19. MEASURES OF CAPITAL EFFICIENCY
509 New York Dairy Farms, 1970

Measure	My farm	Average of 509 farms
Total capital per man	$_____	$62,400
Total capital per cow	_____	2,112
Machinery and equipment per cow	_____	447
Land and building investment per cow	_____	1,026
Land and building investment per crop acre	_____	397
Total capital per cwt. milk sold	_____	17
Capital turnover (capital ÷ receipts)	_____	2.1

Capital efficiency is often associated with size of herd. For this reason, the 509 farms were sorted on the basis of number of cows and the capital efficiency measures were calculated. There seemed to be a relationship between size and capital efficiency for machinery but not for real estate.

Table 20. SIZE OF HERD AND CAPITAL EFFICIENCY
509 New York Dairy Farms, 1970

Number of cows	Number of farms	Capital Investment Per Cow		
		Total	Real estate	Machinery
Under 40	98	$2,350	$1,211	$512
40 - 54	150	2,161	1,033	496
55 - 69	91	2,098	997	471
70 - 84	63	2,132	1,040	442
85 - 99	32	2,069	964	425
100 and over	75	2,029	999	391

The financial situation is an important part of the analysis of a farm business. This indicates the condition of the operation as it relates to present financing and future expansion possibilities. In the 509 records for 1970, a total of 159 included a financial situation statement. These were summarized and the results are reported below.

Table 21. FARM FAMILY FINANCIAL SITUATION
159 New York Dairy Farms, January 1, 1971

Item	My farm	Farms Reporting		Average 159 Farms	
		Number	Percent	Amount	Percent
Assets					
Farm land and buildings	$_____	159	100	$ 60,587	43
Livestock	_____	159	100	29,052	21
Machinery	_____	159	100	27,279	19
Feed and supplies	_____	159	100	8,663	6
Co-op investment	_____	112	70	1,735	1
Accounts receivable	_____	90	57	2,548	2
Cash and checking accounts	_____	136	86	1,313	1
Savings accounts	_____	81	51	1,863	1
Cash value life insurance	_____	104	65	2,614	2
Stocks and bonds	_____	70	44	1,951	1
Nonfarm real estate	_____	23	14	1,901	1
Auto (personal share)	_____	125	79	894	1
All other	_____			1,463	1
TOTAL ASSETS	$_____			$141,863	100
Liabilities					
Real estate mortgage	$_____	115	72	$ 18,826	46
Liens on cattle & equipt.	_____	86	54	13,033	31
Installment contracts	_____	45	28	1,928	5
Secured notes	_____	45	28	3,757	9
Unsecured notes	_____	39	25	1,958	5
Store accounts	_____	112	70	1,281	3
Personal debt and other	_____	37	23	539	1
TOTAL LIABILITIES	$_____	143	90	$ 41,322	100
NET WORTH	$_____			$100,541	

The farm inventory accounted for 89 percent of the total family assets reported. The cash value of life insurance and accounts receivable each accounted for two percent. Real estate mortgages were the largest liability and accounted for 46 percent of all debts.

Table 22. DEBT COMMITMENTS AND FINANCIAL MEASURES
159 New York Dairy Farms, 1970

	My farm	Average 159 farms
Annual Debt Commitments:		
Real estate mortgage	$_____	$2,420
Cattle & equipment liens	_____	3,010
Notes	_____	1,360
Installment contracts	_____	330
All other	_____	1,150
Total debt payments	$_____	$8,270
Financial Measures:		
Number of cows	_____	59
Annual debt payment/cow	$_____	$140
Debt payment as % milk check	_____%	18%
Percent equity	_____%	71%
Percent debt on real estate	_____%	46%
Debt per cow	$_____	$700

The annual debt commitments for interest and principle averaged $8,270. The largest amount committed was for cattle and equipment liens. These commitments averaged nearly $700 per month and $140 per cow per year.

Debts on the 159 farms reporting amounted to 29 percent of the total assets. This gives an average equity of 71 percent. The range in percent equity was from 8 to 100. The debt per cow ranged from $50 to $2,200.

The percent equity was highest for the herds with under 40 cows and lowest for those with 85 or more cows. Debt per cow on the other hand was highest for the large herds and lowest for the herds with under 40 cows.

Table 23. FINANCIAL SITUATION BY SIZE OF HERD
159 New York Dairy Farms, 1970

Herd size (Cows)	Number of Farms	Number of Cows	Total assets	Total liabilities	Net worth	Percent equity	Debt per cow
Under 40	40	32	$ 92,298	$18,094	$74,204	80	$558
40 - 54	47	46	110,447	31,078	79,369	72	676
55 - 69	28	60	136,127	44,488	91,639	67	741
70 - 84	20	75	168,516	48,512	120,004	71	647
85 & over	24	116	270,472	90,409	180,063	67	779

Cost Control

Keeping costs in line can make the difference between profit and loss. Small as well as large costs must be checked. An analysis of the various costs is one step in maintaining good cost control. Several important costs are examined below.

Feed Costs

Purchased feed is the largest single expense item on most New York dairy farms. For the 509 farms in 1970, dairy concentrate accounted for 37 percent of the cash operating expenses. For this reason, feed is the first item examined in the "cost control" section.

Dairy feed costs are affected by many things. It is difficult to find a satisfactory single measure of feed cost control. Consequently, the feed situation generally is looked at in the business analysis of feed costs. Below are some measures related to feed costs on a dairy farm.

Table 24. ITEMS RELATED TO FEED COSTS
509 New York Dairy Farms, 1970

Item	My farm	Average of 509 farms
Feed expense		
Dairy feed purchased	$_____	$12,463
Feed purchased as % of milk receipts	_____ %	25%
Feed purchased per cwt. of milk sold	$_____	$1.52
Feed purchased per cow	$_____	$192
Crop expense per cow	$_____	$50
Total feed and crop expense per cow	$_____	$242
Total feed and crop expense per cwt. of milk sold	$_____	$1.91
Roughage harvested (hay equivalent)		
Hay (tons)	_____	242
Corn silage (tons ÷ 3)	_____	240
Hay crop silage (tons ÷ 2 or 3)*	_____	7
Total tons hay equivalent	_____	489
Tons hay equivalent per cow	_____	7.5
Other considerations		
Acres in crops per cow	_____	2.6
Lime and fertilizer expense per cow	$_____	$33
Lime and fertilizer expense per crop acre	$_____	$13
Number of heifers per 10 cows	_____	6.6

* Depending on moisture content of silage

The above measures of roughage harvested consider quantity only. Quality is also important and should be considered when studying the feeding program.

Feed cost is influenced by a number of factors. On the production side, it is affected by the amount of home-grown grains, quality and quantity of the roughage, and the number of youngstock. On the purchasing side, it is influenced by the farmer's ability to purchase concentrates at low costs.

Feed purchased as percent of milk receipts is calculated by dividing feed purchased by milk receipts. This measure can be used to determine whether the feed costs are in line. The amount of home-grown grain must be considered as you evaluate this measure. Milk prices also influence this factor.

Feed purchased per cow is calculated by dividing the total expense for dairy concentrate by the average number of cows. Because this also includes the amount spent for calf and heifer feed, it actually represents the feed cost per cow and the replacements being raised.

Total crop expense per cow is calculated by dividing the total money spent for fertilizer and lime, seeds and plants, spray, and other crop expense by the average number of cows. This represents the direct cash costs of the dairyman for growing feed.

Total feed and crop expense is determined by adding the purchased feed expense to total crop expense. This indicates the total amount spent by the dairyman to provide the feed requirements of the herd. If the dairyman gets a high amount of nutrients per dollar spent and feeds these nutrients so as to get efficient milk production per unit of nutrient, he will keep his feed and crop expense per hundredweight of milk down.

Number of heifers per ten cows is figured by dividing the number of heifers by the number of cows and multiplying by ten.

Table 25. PERCENT PURCHASED FEED IS OF MILK RECEIPTS AND LABOR INCOME
509 New York Dairy Farms, 1970

% Feed is of milk	Number of farms	Number of cows	H.E. per cow	Lbs. milk per cow	Labor income per operator
Over 40%	12	52	6.8	12,500	$ 5,295
35 - 39	40	64	6.4	11,500	4,094
30 - 34	103	62	6.8	12,600	6,171
25 - 29	124	65	7.6	12,700	7,910
20 - 24	121	64	7.9	12,800	9,374
Under 20%	109	70	7.5	12,600	10,510

In general, the lower the percent of the milk check going for purchased feed, the higher the income (table 25). Farms with a lower percent of the milk check going for purchased feed had more tons of hay equivalent per cow. This suggests that adequate supplies of roughage has an effect on concentrate purchases and labor incomes.

Power and Machinery Costs

Mechanization on dairy farms has been proceeding at a relatively rapid pace. This increases the importance of analyzing the power and machinery costs. On the 509 farms, net power and machinery costs accounted for 24 percent of the total farm expenses in 1970. Below are the calculations of the power and machinery costs and related factors.

Table 26. POWER AND MACHINERY COST*
509 New York Dairy Farms, 1970

Item	My farm	Average of 509 farms	Percent of total
Beginning inventory	$_____	$26,799	
New machinery purchased	_____	6,480	
Total (no. 1)	$_____	$33,279	
End inventory	$_____	$29,067	
Machinery sold	_____	114	
Total (no. 2)	$_____	$29,181	
Depreciation (Total no. 1 minus Total no. 2)	$_____	$ 4,098	35
Interest at 7% on av. inventory	_____	1,955	17
Gas and oil	_____	1,381	12
Machinery repairs	_____	2,272	20
Milk hauling	_____	545	5
Machine hire	_____	290	3
Auto expense (farm share)	_____	243	2
Electricity (farm share)	_____	769	6
Total power and machinery cost	$_____	$11,553	100
Less:			
Gas tax refund	$_____	$101	
Income from machine work	_____	92	
		193	
NET POWER AND MACHINERY COST	$_____	$11,360	
Net machinery cost:			
per cow	$_____	$175	
per crop acre	$_____	$68	
per cwt. milk sold	$_____	$1.38	
per man	$_____	$5,164	

* Does not include insurance, housing, or value of labor used in operation or repair

Labor and Machinery Costs

The primary justification given for more mechanization is to reduce labor costs. However, if a machine is added without expanding size or reducing the labor force, costs will be increased. "Labor and machinery cost" provides a measure of the efficiency of the operator's machinery and labor combination.

Table 27. LABOR AND MACHINERY COST
509 New York Dairy Farms, 1970

Item	My farm	Average of 509 farms
Labor cost:		
Value of operators' labor*	$_____	$ 6,355
Hired labor	_____	4,388
Unpaid family labor	_____	775
Total Labor Cost	$_____	$11,518
Net power and machinery cost (p. 24)	_____	11,360
TOTAL LABOR AND MACHINERY COST	$_____	$22,878
Labor cost:		
per cow	$_____	$177
per cwt. milk sold	$_____	$1.40
Labor and machinery cost:		
per cow	$_____	$352
per cwt. milk sold	$_____	$2.78

* Values at $5,400 per operator - some farms had more than one operator

Labor and machinery cost per cow appears to have an effect on labor income (table 28). As the labor and machinery cost per cow decreased the labor income tended to increase.

Table 28. LABOR AND MACHINERY COST PER COW AND LABOR INCOME
509 New York Dairy Farms, 1970

Labor & machinery cost per cow	Number of farms	Percent of farms	Labor income per operator
$500 and over	32	6	$ 3,191
450 - 499	39	8	4,648
400 - 449	79	16	5,488
350 - 399	106	21	9,285
300 - 349	147	29	8,555
250 - 299	84	16	11,078
Less than $250	22	4	10,653

Miscellaneous Cost Control Measures

Cost control applies to all expenditures both large and small. Reducing various cost items to a per cow or per acre basis provides cost control measures which are easy to understand and they can be used for analyzing farms of various sizes. These factors are influenced by a number of things so must be used with that in mind.

Table 29. COST CONTROL MEASURES
509 New York Dairy Farms, 1970

Item	My farm	Average of 509 farms
Overhead		
Land and building repair per cow	$_____	$ 17
Taxes per cow	_____	22
Insurance per cow	_____	13
Electricity per cow	_____	12
Machinery		
Machinery depreciation per cow	$_____	$ 63
Machinery repair per cow	_____	35
Gas and oil per cow	_____	21
Net machinery cost per cow	_____	175
Dairy		
Veterinary and medicine per cow	$_____	$ 13
Breeding fees per cow	_____	9
Other livestock expense per cow	_____	29
Crop		
Fertilizer and lime per crop acre	$_____	$ 13
Seeds and plants per crop acre	_____	3
Other crop expense per crop acre	_____	3
Gas and oil per crop acre	_____	8
General		
Total labor per cow*	$_____	$177
Total feed and crop expense per cow	_____	242
Total expenses per cow	_____	735
Total expenses per $100 receipts	_____	72

* Using $5,400 per year for operator's labor

Combination of Factors

Individual factors have been examined in the analysis up to this point. It has been suggested that these factors are interrelated. In this section, the combination of factors is studied. The factors used here are size, rates of production, labor efficiency, and cost control as measured by number of cows, pounds of milk sold per cow, pounds of milk sold per man, and percent purchased feed was of milk receipts.

For each factor, the farms were divided on the basis of whether they were above or below the average for the 509 farms. They were then grouped on the basis of the number of factors better than average. The combination of factors above or below average within the three middle groups varied.

Table 30. COMBINATION OF FACTORS ABOVE AVERAGE* AND LABOR INCOME
509 New York Dairy Farms, 1970

Number of factors above average	Number of farms	Percent of farms	Labor income per operator
4 factors better than average	50	10	$19,181
3 factors better than average	114	22	10,936
2 factors better than average	137	27	7,466
1 factor better than average	142	28	5,607
0 factors better than average	66	13	3,682

* Factors were:
Size - number of cows - average 65
Rates of production - pounds of milk sold per cow - average 12,600
Labor efficiency - pounds of milk sold per man - average 373,700
Cost control - percent purchased feed was of milk receipts - average 25%

The relationship between the number of factors better than average and labor income is shown in table 30. As the number of factors better than average decreased, labor incomes decreased at a rapid rate. In order to get a labor income higher than good hired men's wages, it appears that a business must be above average in at least two factors.

It is important in managing a farm business to give attention to all major factors affecting the business. Concentrating on only one or two factors and neglecting the others, will not give the kind of net income most farmers want.

Comparison by Herd Size

In making an analysis of an individual farm business, it is helpful to compare it with businesses of approximately the same size. On the following four pages, the business summary and business factors for the 509 farms are shown for six herd size groups. These data also illustrate the effect of size on various business factors.

Table 31. FARM BUSINESS SUMMARY BY HERD SIZE
509 New York Dairy Farms, 1970

Item	My farm	Farms with: Less than 40 cows	40 to 54 cows	55 to 69 cows
Capital Investment (end of year)				
Machinery and equipment	$_____	$16,381	$22,816	$ 28,714
Livestock	_____	16,116	23,298	30,099
Feed and supplies	_____	3,952	5,756	8,340
Land and buildings	_____	38,755	47,535	60,808
TOTAL INVESTMENT	$_____	$75,204	$99,405	$127,961
Receipts				
Milk sales	$_____	$23,747	$34,995	$ 46,419
Livestock sold	_____	2,376	3,675	4,454
Crop sales	_____	203	337	233
Miscellaneous receipts	_____	862	993	1,493
Total Cash Receipts	$_____	$27,188	$40,000	$ 52,599
Increase in inventory	_____	3,894	8,213	7,706
TOTAL FARM RECEIPTS	$_____	$31,082	$48,213	$ 60,305
Expenses				
Hired labor	$_____	$ 778	$ 1,903	$ 3,206
Dairy feed	_____	6,050	9,022	11,797
Other feed	_____	337	239	441
Machine hire	_____	129	213	329
Machinery repair	_____	973	1,480	1,896
Auto expense (farm share)	_____	220	254	235
Gas and oil	_____	738	987	1,291
Breeding fees	_____	278	431	590
Veterinary and medicine	_____	374	595	770
Other livestock expense	_____	1,097	1,506	2,383
Lime and fertilizer	_____	774	1,234	1,941
Seeds and plants	_____	260	374	571
Spray and other crop expense	_____	202	413	534
Land, bldg., fence repair	_____	615	828	1,033
Taxes and insurance	_____	1,235	1,646	1,934
Electricity & phone (farm share)	_____	539	704	878
Miscellaneous expenses	_____	494	790	1,049
Total Cash Operating Expenses	$_____	$15,093	$22,619	$ 30,878
New machinery	_____	3,542	5,302	6,367
New real estate	_____	1,213	3,724	3,212
Purchased livestock	_____	832	1,680	1,562
Unpaid family labor	_____	688	860	752
TOTAL FARM EXPENSES	$_____	$21,368	$34,185	$ 42,771
Financial Summary				
Total Farm Receipts	$_____	$31,082	$48,213	$ 60,305
Total Farm Expenses	_____	21,368	34,185	42,771
Farm Income	$_____	$ 9,714	$14,028	$ 17,534
Interest on av. capital at 7%	_____	5,128	6,671	8,688
Labor Income per Farm	$_____	$ 4,586	$ 7,357	$ 8,846
Number of operators	_____	101	165	109
LABOR INCOME PER OPERATOR	$_____	$ 4,449	$ 6,688	$ 7,386

Table 31 contd. FARM BUSINESS SUMMARY BY HERD SIZE
509 New York Dairy Farms, 1970

Item	My farm	Farms with: 70 to 84 cows	85 to 99 cows	100 or more cows
Capital Investment (end of year)				
Machinery and equipment	$_____	$ 33,633	$ 39,120	$ 50,445
Livestock	_____	38,911	47,907	61,144
Feed and supplies	_____	10,432	14,663	21,301
Land and buildings	_____	79,060	88,669	128,902
TOTAL INVESTMENT	$_____	$162,036	$190,359	$261,792
Receipts				
Milk sales	$_____	$ 58,609	$ 74,784	$101,896
Livestock sold	_____	6,545	8,379	9,859
Crop sales	_____	612	595	944
Miscellaneous receipts	_____	1,504	1,704	2,241
Total Cash Receipts	$_____	$ 67,270	$ 85,462	$114,940
Increase in inventory	_____	10,524	13,208	18,497
TOTAL FARM RECEIPTS	$_____	$ 77,794	$ 98,670	$133,437
Expenses				
Hired labor	$_____	$ 5,321	$ 8,971	$ 12,772
Dairy feed	_____	15,378	18,269	23,605
Other feed	_____	370	408	461
Machine hire	_____	276	304	611
Machinery repair	_____	2,643	3,484	5,180
Auto expense (farm share)	_____	222	287	263
Gas and oil	_____	1,555	1,768	2,805
Breeding fees	_____	694	949	1,025
Veterinary and medicine	_____	963	1,253	1,686
Other livestock expense	_____	2,748	3,863	5,232
Lime and fertilizer	_____	2,428	3,288	5,095
Seeds and plants	_____	674	826	1,163
Spray and other crop expense	_____	729	751	1,135
Land, bldg., fence repair	_____	1,090	1,330	2,215
Taxes and insurance	_____	2,895	3,227	4,593
Electricity & phone (farm share)	_____	1,141	1,312	1,748
Miscellaneous expenses	_____	1,305	1,639	2,898
Total Cash Operating Expenses	$_____	$ 40,432	$ 51,929	$ 72,487
New machinery	_____	7,632	8,179	11,120
New real estate	_____	4,574	6,027	9,456
Purchased livestock	_____	2,667	3,546	5,200
Unpaid family labor	_____	676	816	816
TOTAL FARM EXPENSES	$_____	$ 55,981	$ 70,497	$ 99,079
Financial Summary				
Total Farm Receipts	$_____	$ 77,794	$ 98,670	$133,437
Total Farm Expenses	_____	55,981	70,497	99,079
Farm Income	$_____	$ 21,813	$ 28,173	$ 34,358
Interest on av. capital at 7%	_____	10,974	12,863	17,678
Labor Income per Farm	$_____	$ 10,839	$ 15,310	$ 16,680
Number of operators	_____	81	39	104
LABOR INCOME PER OPERATOR	$_____	$ 8,430	$ 12,562	$ 12,029

Table 32. SELECTED BUSINESS FACTORS BY HERD SIZE
509 New York Dairy Farms, 1970

Item	My farm	Farms with: Less than 40 cows	40 to 54 cows	55 to 69 cows
Number of farms		98	150	91
Size of Business				
Number of cows	_____	32	46	61
Pounds of milk sold	_____	394,300	581,100	767,300
Crop acres	_____	87	125	154
Man equivalent	_____	1.4	1.7	2.1
Total work units	_____	350	501	644
Rates of Production				
Milk sold per cow	_____	12,300	12,600	12,600
Tons hay per acre	_____	2.5	2.6	2.9
Tons corn silage per acre	_____	14	15	15
Bushels of oats per acre	_____	64	64	62
Labor Efficiency				
Cows per man	_____	23	27	29
Pounds milk sold per man	_____	281,600	341,800	365,400
Work units per man	_____	250	295	307
Crop acres per man	_____	62	74	73
Feed Costs				
Feed purchased per cow	$_____	$189	$196	$193
Crop expense per cow	$_____	$39	$44	$50
Feed and crop expense per cow	$_____	$228	$240	$243
Feed cost per cwt. milk	$_____	$1.53	$1.55	$1.54
Feed and crop exp./cwt. milk	$_____	$1.84	$2.40	$1.93
% Feed is of milk receipts	_____%	25%	26%	25%
Hay equivalent per cow	_____	7.2	7.5	7.6
Crop acres per cow	_____	2.7	2.7	2.5
Fertilizer and lime/crop acre	$_____	$9	$10	$13
Machinery Costs				
Total machinery costs	$_____	$6,020	$8,237	$10,927
Machinery cost per cow	$_____	$188	$179	$171
Machinery cost per man	$_____	$4,300	$4,845	$5,203
Machinery cost per cwt. milk	$_____	$1.53	$1.42	$1.42
Machinery cost per crop acre	$_____	$69	$66	$71
Capital Efficiency				
Investment per man	$_____	$53,717	$58,474	$60,934
Investment per cow	$_____	$2,350	$2,161	$2,098
Investment per cwt. milk sold	$_____	$19	$17	$17
Land and buildings per cow	$_____	$1,211	$1,033	$997
Machinery investment per cow	$_____	$512	$496	$471
Return on investment	_____%	5.7%	8.5%	8.9%
Other				
Price per cwt. milk sold	$_____	$6.02	$6.02	$6.05
Acres hay and hay crop silage	_____	60	78	88
Acres corn silage	_____	16	28	41

Table 32 contd. SELECTED BUSINESS FACTORS BY HERD SIZE
509 New York Dairy Farms, 1970

Item	My farm	Farms with: 70 to 84 cows	85 to 99 cows	100 or more cows
Number of farms		63	32	75
Size of Business				
Number of cows	_____	76	92	129
Pounds of milk sold	_____	962,100	1,235,800	1,636,100
Crop acres	_____	195	228	311
Man equivalent	_____	2.5	3.0	3.6
Total work units	_____	821	970	1,348
Rates of Production				
Milk sold per cow	_____	12,700	13,400	12,700
Tons hay per acre	_____	2.8	2.7	2.7
Tons corn silage per acre	_____	16	16	15
Bushels oats per acre	_____	59	65	69
Labor Efficiency				
Cows per man	_____	30	31	36
Pounds milk sold per man	_____	384,800	411,900	454,500
Work units per man	_____	328	323	374
Crop acres per man	_____	78	76	86
Feed Costs				
Feed purchased per cow	$_____	$202	$199	$183
Crop expense per cow	$_____	$50	$55	$57
Feed & crop expense per cow	$_____	$252	$254	$240
Feed cost per cwt. milk	$_____	$1.60	$1.48	$1.44
Feed & crop cost exp./cwt. milk	$_____	$2.00	$1.89	$1.89
% Feed is of milk receipts	_____%	26%	24%	23%
Hay equivalent per cow	_____	8.1	7.4	6.9
Crop acres per cow	_____	2.6	2.5	2.4
Fertilizer & lime/crop acre	$_____	$12	$14	$16
Machinery Costs				
Total machinery costs	$_____	$12,929	$15,673	$21,958
Machinery costs per cow	$_____	$170	$170	$170
Machinery cost per man	$_____	$5,172	$5,224	$5,999
Machinery cost per cwt. milk	$_____	$1.34	$1.27	$1.32
Machinery cost per crop acre	$_____	$66	$69	$71
Capital Efficiency				
Investment per man	$_____	$64,814	$63,453	$72,720
Investment per cow	$_____	$2,132	$2,069	$2,029
Investment per cwt. milk sold	$_____	$17	$15	$16
Land and building per cow	$_____	$1,040	$964	$999
Machinery investment per cow	$_____	$442	$425	$391
Return on investment	_____%	9.4%	11.8%	10.6%
Other				
Price per cwt. milk sold	$_____	$6.09	$6.05	$6.23
Acres hay and hay crop silage	_____	106	124	145
Acres corn silage	_____	58	62	101

Farm Business Chart

The chart on the next two pages is a tool for use in analyzing a dairy farm business. It is essentially a series of measuring sticks combined into one tool.

FARM BUSINESS CHART FOR FARM MANAGEMENT COOPERATORS
509 New York Dairy Farms*, 1970

Size of Business			Rates of Production			Labor Efficiency	
Man equiv-alent	No. of cows	Pounds milk sold	Pounds milk sold per cow	Tons hay per acre	Tons corn silage per acre	Cows per man	Pounds milk sold per man
4.8	142	1,773,400	15,800	4.7	22	48	612,400
3.8	98	1,298,800	14,700	3.8	19	38	488,400
2.6	79	1,014,600	14,000	3.4	18	35	439,800
2.3	67	857,600	13,600	3.0	16	32	404,300
2.1	59	739,300	13,100	2.7	15	30	378,400
2.0	52	656,800	12,700	2.5	15	28	351,400
1.7	47	590,200	12,100	2.4	14	26	323,300
1.5	42	515,700	11,300	2.1	12	24	298,000
1.3	36	424,700	10,400	1.8	10	22	266,200
1.1	29	240,800	8,400	1.3	6	18	196,800

* These farms are considerably above the average for all farms in New York State. For example, the median number of cows for the 509 farms was 55 compared with 38 for all farms in the state.

The Farm Business Chart is a tool which can be used in analyzing a business to determine the strong and weak points. The chart shows how far the individual farm is above or below the midpoint of the 509 farms for each factor.

The figure at the top of each column is the average of the top 10 percent of the farms for that factor. For example, the figure 4.8 at the top of the column headed "Man equivalent" is the average man equivalent on the 10 percent of the farms with the most men. The other figures in each column are the average for the second 10 percent, third 10 percent, etc. The figure at the bottom of each column (1.1 for man equivalent) is the average for the 10 percent of the farms which ranked lowest in that factor.

Each column of the chart is independent of the others. The farms which are in the top 10 percent for one factor would not necessarily be the same farms which make up the top 10 percent for any other factor.

This chart is used in analyzing a particular dairy business by drawing a line through the figure in each column which shows where the farm being analyzed stands for that factor. This helps identify the strengths and weaknesses. Summarize these and list them at the bottom of the next page.

Farm Business Chart contd.

The cost control factors are ranked from low to high. For cost control factors, the lowest cost is not necessarily the most profitable. In some cases, the "best" might be somewhere near the average. Many things affect the level of these costs, and these items must be taken into account when analyzing the factors.

FARM BUSINESS CHART FOR FARM MANAGEMENT COOPERATORS
509 New York Dairy Farms, 1970
Cost Control

Feed bought per cow	% Feed is of milk receipts	Machinery cost per cow	Labor and machinery cost per cow	Feed and crop expense per cwt. milk
$ 83	12%	$107	$248	$1.13
125	17	129	285	1.47
148	20	142	307	1.62
169	22	152	326	1.74
185	24	164	342	1.84
202	26	179	362	1.95
218	28	192	385	2.07
233	31	208	411	2.20
254	33	230	445	2.34
306	38	294	527	2.74

Based on the analyzed results shown on the business chart, list below the strong and weak points of the business. Then identify the major problems.

STRONG POINTS:

WEAK POINTS:

MAJOR PROBLEMS:

After identifying problems, consider alternative ways of solving each problem. Each alternative should be studied in detail. A budgeting form can be used for projecting the likely results of each alternative.

SUPPLEMENTAL INFORMATION

Cost of Producing Milk

The cost of producing milk can be calculated by using the total farm business summary if the operations have dairy as the only principal enterprise. The average cost per hundredweight of producing milk on the 509 farms and comparisons with earlier years is shown on page 35.

Farms With Free Stall Barns

There has been much interest in free stall barns in recent years. Farms with free stall barns were identified for the 1970 cooperators. A total of 117 reported free stall facilities and were included in a special analysis. The business factors for the free stall farms have been compared with the other types. For the most part, "other" refers to conventional stanchion or tie-stall barns but some have various combinations such as a milking parlor with a stanchion barn.

The information reported on pages 36 and 37 may provide a basis for determining differences that can be expected if one goes to a free stall type of dairy housing.

Trends

The manager of any business must keep abreast of current trends. This is essential if he is to keep his business in tune with the times. It is also important as one develops plans for the future.

Trends can be measured in different ways. One way is to compare similar business studies to observe changes that have occurred. On page 38, selected farm business summary factors are given for 1960, 1965, 1969, and 1970.

Operating Statements

Operating statements are common in business accounting. In farm accounting, business summaries are prepared and business factors calculated. This is essentially an operating statement for the farm business. Operating statements based on the study of the 509 dairy farms for 1970 are presented on pages 39 and 40. Here the highlights of the year's operations are presented on one page.

The statement on page 40 is based on the average for all 509 farms. However, in making comparisons for establishing goals, one is often interested in what the "better" businesses accomplish. For this purpose, the 10 percent of the farms with the highest labor incomes were grouped together and an operating statement prepared (page 39).

Cost of Producing Milk

By adding an estimate of the value of the operator's labor and interest on the capital investment to the total farm expenses, the farm cost of producing milk can be calculated. The value of the operator's time for 1970 was estimated at $450 per month. Receipts for items other than milk are credited against the total cost. This assumes that these items were produced at cost.

Table 33. AVERAGE FARM COST OF PRODUCING MILK
509 New York Dairy Farms, 1970

Item	My farm	Average of 509 Farms
Total farm expenses	$_____	$47,795
Interest at 7% on average capital	_____	9,278
Value of operators' labor*	_____	6,355
Total Costs	$_____	$63,428
Total farm receipts	$_____	$66,467
Less milk sales	_____	50,154
Other Income	_____	16,313
Cost of Producing Milk (total costs less other income)	$_____	$47,115
Hundredweights of milk sold	_____	8,222
Cost per cwt. of milk sold	$_____	$5.73
Average price received	$_____	$6.10

* Figured at $5,400 per operator (there were 599 operators on 509 farms)

The average cost of producing milk using the whole farm figures has been calculated for selected years and is shown below. The average price received is also reported.

COST OF PRODUCING MILK AND PRICES RECEIVED

Year	Operator's labor	Cwt. milk sold	Cost per cwt.	Av. price received
1959	$3,600	3,274	$4.76	$4.73
1964	3,600	4,504	4.55	4.40
1968	5,400	7,152	4.98	5.52
1969	5,400	7,617	5.41*	5.80
1970	5,400	8,222	5.73*	6.10

* Used 7% interest charge (in previous years 5% was used)

Farms With Free Stall Barns

Free stall barns with milking parlors are a relatively new feature on New York dairy farms. Advantages in the use of labor have been pointed out for the new type facilities. Many dairymen have been interested in learning more about the results from operations with this type of housing.

A total of 117 of the 509 farms in the 1970 summary were reported to have free stall barns. These were separated out for analysis. The averages for the free stall operations have been compared with the nonfree stall or other types of housing (table 34).

Table 34. COMPARISON OF FARMS WITH FREE STALL BARNS AND ALL OTHERS
509 New York Dairy Farms, 1970

Item	My farm	Farms with free stall barns	Farms with other types of barns
Number of farms		117	392
Size			
Man equivalent	_____	2.8	2.0
Number of cows	_____	94	56
Lbs. milk sold	_____	1,200,000	710,000
Milk Produced			
Lbs. milk sold per cow	_____	12,760	12,670
Lbs. milk sold per man	_____	428,000	355,000
Capital Use			
Land & building value	$_____	$95,300	$58,000
Total inventory value	$_____	$196,800	$119,200
Land & building per cow	$_____	$1,010	$1,040
Total inventory per cow	$_____	$2,090	$2,130
Total inventory per man	$_____	$70,300	$59,600
Total inventory per cwt. milk	$_____	$16	$17
Cost Factors			
Total labor cost	$_____	$15,300	$10,400
Total machinery cost	$_____	$16,200	$9,900
Labor cost per cow	$_____	$163	$186
Machinery cost per cow	$_____	$172	$177
Labor & machinery cost/cwt. milk	$_____	$2.62	$2.86
Financial Summary			
Total farm receipts	$_____	$100,645	$56,564
Total farm expenses	$_____	$74,649	$40,079
Labor income per operator	$_____	$11,078	$7,213
Receipts per cow	$_____	$1,070	$1,010
Expense per cow	$_____	$790	$720
Labor income per cow	$_____	$118	$129

The free stall operations had an average of 94 cows while the others had 56. The 117 farms sold an average of 1.2 million pounds of milk. In general, the free stall operations were larger and had higher labor incomes - $11,000 versus $7,000 (table 34).

Table 35. COMPARISON OF FARMS WITH FREE STALL AND OTHER TYPES OF BARNS BY HERD SIZE, 509 New York Dairy Farms, 1970

Herd size	Number of Farms		Number of Men		Number of Cows	
	Free stall	Other	Free stall	Other	Free stall	Other
Under 60	23	259	1.9	1.6	50	42
60 - 79	29	77	2.2	2.3	69	68
80 - 99	15	31	2.6	3.0	88	89
100 - 119	25	14	3.2	3.6	108	108
120 & over	25	11	3.8	4.2	154	147

Herd size	Land & Bldg./Cow		Lbs. Milk Sold/Cow		Lbs. Milk Sold/Man	
	Free stall	Other	Free stall	Other	Free stall	Other
Under 60	$1,197	$1,056	12,600	12,500	332,000	327,000
60 - 79	994	990	12,500	12,600	391,000	374,000
80 - 99	950	1,054	13,300	13,400	451,000	398,000
100 - 119	971	1,039	12,700	13,700	428,000	410,000
120 & over	1,014	970	12,700	11,600	516,000	405,000

Herd size	Labor Cost/Cow		Machinery Cost/Cow		Labor Income/Operator	
	Free stall	Other	Free stall	Other	Free stall	Other
Under 60	$186	$195	$182	$180	$ 6,620	$ 6,020
60 - 79	166	172	189	172	8,420	7,780
80 - 99	163	167	175	167	11,580	11,660
100 - 119	167	187	174	196	13,260	9,990
120 & over	149	168	159	166	15,980	15,390

Since size is a major factor affecting incomes on dairy farms, the free stall operations were studied by size of herd (table 35). For comparable herd sizes, the free stall operations had fewer men and sold more pounds of milk per man. There appeared to be no significant difference in milk sold per cow between the free stall and others.

Total capital was larger on the free stall farms but the per cow investment for both land and buildings and total was slightly less for the free stall operations than the others. For all size groups, the labor cost per cow was less for the free stall operations. Machinery costs per cow were higher for the free stall farms with less than 100 cows but lower for those with over 100 cows. By size groups, the free stall operations had higher labor incomes but the difference was much smaller than that indicated by the overall averages.

Table 36. SELECTED FARM BUSINESS SUMMARY FACTORS
New York Dairy Farms, Selected Years 1960-1970

Item	Year			
	1960	1965	1969	1970
Number of farms	467	673	511	509
Financial Summary				
Average capital invested	$47,426	$66,908	$116,525	$132,545
Total farm receipts	$20,075	$30,488	$59,662	$66,467
Total farm expenses	$14,768	$21,995	$42,293	$47,795
Labor income per operator	$3,317	$4,680	$9,879 ($7,885)*	$10,200 ($7,983)*
Size of Business				
Number of cows	35	44	60	65
Pounds of milk sold	333,900	523,900	761,700	822,200
Crop acres	96	123	156	168
Man equivalent	1.7	1.8	2.1	2.2
Total work units	480	568	692	691
Rates of Production				
Milk sold per cow	9,540	11,900	12,700	12,600
Tons hay per acre	2.3	2.1	2.8	2.7
Tons corn silage per acre	10	13	16	15
Labor Efficiency				
Cows per man	21	24	29	30
Pounds milk sold per man	196,400	291,100	362,700	373,700
Work units per man	282	316	330	314
Cost Control Factors				
Machinery cost per cow	$107	$116	$167	$175
Machinery cost/cwt. milk	$1.12	$.97	$1.32	$1.38
Feed bought per cow	$124	$154	$180	$192
Feed bought/cwt. milk	$1.30	$1.29	$1.42	$1.52
Feed & crop expense/cwt. milk	$1.63	$1.60	$1.68	$1.91
% Feed is of milk receipts	28%	29%	24%	25%
Capital Efficiency				
Total investment per man	$28,674	$38,250	$57,724	$62,385
Total investment per cow	$1,392	$1,560	$2,020	$2,112
Machinery investment/cow	$287	$335	$452	$447
Total investment/cwt. milk	$15	$13	$16	$17
Other				
Price per cwt. milk sold	$4.64	$4.41	$5.80	$6.10
Acres hay & hay crop silage	78	81	85	119
Acres corn silage	15	20	42	49
Total acres in crops/cow	2.7	2.8	2.6	2.6
Lime & fertilizer expense per crop acre	$7	$9	$13	$13
Farm income per cow	$170	$193	$290	$287
Labor income per cow	$102	$106	$154	$145

* Labor income using a 7% interest charge on all capital

SOURCE: A.E. Res. 70, A.E. Res. 207, and A.E. Res. 322

Table 37. FARM BUSINESS SUMMARY
Top 10 Percent of the Farms by Labor Income
509 New York Dairy Farms, 1970

CAPITAL INVESTMENT

	1/1/70	1/1/71
Machinery & equipment	$ 38,333	$ 41,972
Livestock	47,360	51,226
Feed & supplies	15,234	18,522
Land & buildings	79,863	86,332
TOTAL INVESTMENT	$180,790	$198,052

EXPENSES

Labor	
Hired	$10,132
Unpaid	900
Feed	
Dairy concentrate	18,297
Hay and other	321
Power and Machinery	
Machine hire	384
Machinery repair	4,027
Auto expense	251
Gas and oil	2,007
Electricity	1,037
Milk hauling	806
Livestock	
Breeding fees	906
Veterinary, medicine	1,390
Other livestock expense	3,381
Crop	
Fertilizer and lime	3,901
Seeds and plants	955
Spray and other	904
Real Estate	
Land, building, fence repair	1,465
Taxes	2,059
Insurance	1,378
Rent	1,300
Capital Items	
New machinery	9,527
Purchased livestock	7,354
New real estate	3,520
Other	
Telephone	238
Miscellaneous	1,079
TOTAL FARM EXPENSES	$77,519

RECEIPTS

Milk sales	$ 86,998
Livestock	8,328
Crop sales	800
Government payments	298
Gas tax refund	127
Machine work	59
Machinery sold	229
Work off farm	101
Miscellaneous	1,091
Total Cash Receipts	$ 98,031
Increase in inventory	17,262
TOTAL FARM RECEIPTS	$115,293

FINANCIAL SUMMARY

Total Farm Receipts	$115,293
Total Farm Expenses	77,519
Farm Income	$ 37,774
Interest on av. capital @ 7%	13,259
Farm Labor Income	$ 24,515
Number of operators	52
LABOR INCOME/OPERATOR	$ 24,043

BUSINESS FACTORS

Man equivalent	2.9
Number of cows	104
Number of heifers	70
Acres of hay	117
Acres of corn silage	77
Acres of other crops	68
Lbs. of milk sold	1,436,900
Lbs. milk sold/cow	13,800
Tons hay/acre	2.9
Tons corn silage/acre	16
Lbs. of milk sold/man	495,500
Cows per man	36
% Feed is of milk receipts	21
Feed & crop expense/cwt. milk	$1.67
Lime & fertilizer/crop acre	$15
Machinery cost/cow	$163
Av. price/cwt. milk	$6.05

Table 38. FARM BUSINESS SUMMARY
Average of 509 New York Dairy Farms, 1970

CAPITAL INVESTMENT

	1/1/70	1/1/71
Machinery & equipment	$ 26,799	$ 29,067
Livestock	29,959	32,187
Feed & supplies	8,257	9,300
Land & buildings	62,827	66,694
TOTAL INVESTMENT	$127,842	$137,248

EXPENSES

Labor	
Hired	$ 4,388
Unpaid	775
Feed	
Dairy concentrate	12,463
Hay and other	354
Power and Machinery	
Machine hire	290
Machinery repair	2,272
Auto expense	243
Gas and oil	1,381
Electricity	769
Milk hauling	529
Livestock	
Breeding fees	583
Veterinary, medicine	832
Other livestock expense	1,906
Crop	
Fertilizer and lime	2,117
Seeds and plants	569
Spray and other	561
Real Estate	
Land, building, fence repair	1,092
Taxes	1,438
Insurance	868
Rent	606
Capital Items	
New machinery	6,480
Purchased livestock	2,254
New real estate	4,244
Other	
Telephone	181
Miscellaneous	600
TOTAL FARM EXPENSES	$47,795

RECEIPTS

Milk sales	$50,154
Livestock sold	5,134
Crop sales	432
Government payments	244
Gas tax refund	101
Machine work	92
Machinery sold	114
Work off farm	79
Miscellaneous	711
Total Cash Receipts	$57,061
Increase in inventory	9,406
TOTAL FARM RECEIPTS	$66,467

FINANCIAL SUMMARY

Total Farm Receipts	$66,467
Total Farm Expenses	47,795
Farm Income	$18,672
Interest on av. capital @ 7%	9,278
Farm Labor Income	$ 9,394
Number of operators	599
LABOR INCOME/OPERATOR	$ 7,983

BUSINESS FACTORS

Man equivalent	2.2
Number of cows	65
Number of heifers	43
Acres of hay	92
Acres of corn silage	49
Total acres of crops	168
Lbs. of milk sold	822,200
Lbs. milk sold/cow	12,600
Tons hay/acre	2.7
Tons corn silage/acre	15
Lbs. of milk sold/man	373,700
Cows per man	30
% Feed is of milk receipts	25
Feed & crop expense/cwt. milk	$1.91
Lime & fertilizer/crop acre	$13
Machinery cost/cow	$175
Av. price/cwt. milk	$6.10